TABLE OF CONTENTS

A. Cover Sheet *(Attach to front of proposal.)*

1. Specify: agricultural project or urban project — individual application or joint application

2. Proposal title--concise but descriptive: **Well No. 5 Rehabilitation and Wellhead Treatment for Iron and Manganese Removal**

3. Principal applicant--organization or affiliation: **City of San Juan Capistrano**

4. Contact--name, title: **Eric Bauman, Senior Engineer, Francie Kennedy, Water Conservation Coordinator**

5. Mailing address: **32400 Paseo Adelanto, San Juan Capistrano, CA 92675**

6. Telephone: **Eric Bauman (949) 487-4312, Francie Kennedy (949) 487-4304**

7. Fax: **(949) 493-3955**

8. E-mail: **ebauman@sanjuancapistrano.org, fkennedy@sanjuancapistrano.org**

9. Funds requested--dollar amount: $ **707,300.**

10. Applicant cost share funds pledged--dollar amount: $ **124,800.**

11. Duration--(month/year to month/year): **March 2001** to **April 2002**

12. State Assembly and Senate districts and Congressional district(s) where the project is to be conducted:
The City of San Juan Capistrano is located in U.S. Congressional District 48, State Senate Districts 33 and 38, and State Assembly Districts 66 and 71.

13. Location and geographic boundaries of the project: **The project is located near the intersection of Paseo Esteban and Calle Arroyo in the City of San Juan Capistrano.**

14. Name and signature of official representing applicant. By signing below, the applicant declares the following:
-- the truthfulness of all representations in the proposal;
-- the individual signing the form is authorized to submit the application on behalf of the applicant;
-- the applicant will comply with contract terms and conditions identified in Section 11 of this PSP.

(printed name of applicant) *(date)*

(signature of applicant)

B. Scope of Work

1. Executive Summary

The City of San Juan Capistrano Public Works-Water Department (CSJC-Water, aka Capistrano Valley Water District) proposes to rehabilitate Well No. 5 to provide local groundwater supply to the Non-Domestic Water System. The proposed project involves installation of new pumping equipment, a wellhead treatment facility and related appurtenances at the existing Well No. 5 site.

Well No. 5 is located along San Juan Creek at the westerly end of C. Russell Cook Park, near the intersection of Paseo Esteban and Calle Arroyo in the City of San Juan Capistrano. In the past, groundwater from Well No. 5 has been used as a primary local source of supply for irrigation and other non-domestic water needs. The well pump capacity was approximately 800 gallons per minute (gpm) and the well has been pump-tested at flows up to nearly 1,100 gpm.

Problems have been experienced with precipitation of mineral deposits and staining areas irrigated with this well water. Due to these staining problems and complaints from residents, the staff discontinued pumping from Well No. 5 service in July 1994. Sampling and water quality analyses of Well No. 5, completed in 2000, indicate that the groundwater continues to have high levels of iron and manganese, about 3.5 milligrams per liter (mg/L) and 1.3 mg/L, respectively.

Well No. 5 had been a consistent source of local groundwater supply to the non-domestic water system until it was removed from service in 1994. In order to improve the water quality from this well and alleviate these problems, wellhead treatment is needed to reduce the concentrations of iron and manganese to acceptable levels.

2. Statement of Critical Local Water Issues

CSJC-Water is highly dependent on imported water to provide the balance of its water supply. CSJC-Water primarily relies upon imported water purchases from the Municipal Water District of Orange County (MWDOC). The Eastern Transmission Main, the Tri-Cities Transmission Main and the South County Pipeline deliver imported water to its service area. Over 85 percent of the CSJC total water demand (combined domestic and non-domestic water systems demand) is met from imported water supply.

CSJC-Water has completed and adopted new Domestic and Non-Domestic Water Master Plans in 1999 and 2000, respectively. A primary CSJC-Water water resources planning objective is reduction of reliance on imported water supplies through development and utilization of local groundwater supplies. CSJC-Water's future water supply goal is a minimum 50 percent of combined domestic and non-domestic water demand will be supplied using local water

supplies by the year 2010.

The CSJC non-domestic water system is a completely separate system from the domestic water system. Water supply to the system is strictly local groundwater, supplemented by domestic water. CSJC sewage flows are treated at the Southeast Regional Reclamation Authority (SERRA) Wastewater Treatment Plant in Dana Point. The City does not have a source of recycled water for the non-domestic system due to the distance that separates the City system and the SERRA plant.

Currently, demand for non-domestic water exceeds the available non-domestic water supply. As a result, more costly imported water supply must be used to supplement non-domestic water supply. Rehabilitation of Well No. 5 has several immediate benefits:

- non-domestic water supply will initially exceed non-domestic demand,
- a portion of existing irrigation demands currently served by the domestic water system, as identified in the non-domestic water master plan, can be converted to non-domestic water service,
- imported water purchases and consumption will be reduced,
- extraction and treatment of lower quality groundwater will help to improve the long-term groundwater basin water quality.

3. Nature, Scope, and Objectives of the Project

Well No. 5 is a developed well in the San Juan Creek sub-basin that was abandoned from the non-domestic system in 1994 due to staining of sidewalks, walls and other surfaces that was caused by high iron and manganese levels in its water. Iron and manganese at current levels (3.5 mg/L and 1.3 mg/L per 2000 test results) are not a health hazard, but tend to damage plumbing fixtures and stain sidewalks and other surfaces a yellow or rust color.

The CSJC-Water Engineering Staff has completed a preliminary investigation and analysis for rehabilitation of Well No. 5. The results of the preliminary investigation and analysis indicate that rehabilitation of Well No. 5 and construction of a wellhead treatment facility will provide a lower cost source of water than imported water supply or other available alternatives. Based upon these results, the CSJC-Water Engineering Staff developed a project scope of work and prepared a Request for Proposals (RFP) to solicit bids to retain a consulting engineering firm to perform the work.

The Scope of Work for this project has been divided into three phases:

- preparation of a feasibility/preliminary design report,
- completion of final design drawings, technical specifications, and contract documents,

- construction of capital improvements at Well No. 5.

Major components of the feasibility/preliminary design phase work include evaluation of water quality data, assessment of the site, development and evaluation of treatment alternatives, development of design criteria, estimation of construction and operation and maintenance costs, and comparison of potentially viable alternatives. Major components of the final design phase include preparation of environmental compliance documentation, surveying, geotechnical investigation, assistance with regulatory permits, preparation of engineering drawings, technical specifications, and contract documents, cost estimating, and bid phase assistance for construction of the proposed wellhead and water treatment and pumping facilities. A copy of Well No. 5 RFP Scope of Work is attached to this application as Exhibit A.

The objective of the Well No. 5 Rehabilitation Project is the redevelopment of this local water supply source to meeting existing non-domestic water system demands and other irrigation demands that are currently served using domestic water. Water supply produced from Well No. 5 will meet all current non-domestic water system demands and allow additional irrigation demands, as identified in the CSJC Non-Domestic Water System Master Plan, to be converted from domestic to non-domestic water service.

4. Methods, Procedures, and Facilities.

The CSJC-Water Engineering Staff has performed a preliminary investigation and analysis for rehabilitation of Well No. 5. Several feasible alternative treatment systems were identified that have a history of success in treatment for iron and manganese removal: including installation of a package water treatment facility, a greensand filtration facility or another type of filtration facility. The CSJC-Water Engineering Staff contacted vendors to obtain equipment costs and prepared cost estimates and economic evaluation for the lowest cost alternative, which was the package water treatment facility.

The results of the preliminary investigation and economic analysis indicate that rehabilitation of Well No. 5 and construction of a wellhead treatment facility will provide a lower cost source of water than imported water supply or other available alternatives. Based upon these results, the CSJC-Water Engineering Staff developed a project scope of work and prepared a Request for Proposals (RFP) to solicit bids to retain a consulting engineering firm to perform the work. During the first project phase, the selected consulting engineering firm will be required to perform a feasibility and preliminary design study. None of the CSJC-Water Engineering Staff study results will be disclosed to the engineering consultant, so that the consultant's feasibility and preliminary design study will be an independent study in order to verify CSJC-Water Engineering Staff study results.

5. Schedule

CSJC-Water Engineering Staff received proposals for the project on February 8, 2001. The CSJC-Water Engineering Staff intends to select an engineering consultant and make a recommendation to the Water Board of Directors for approval at the March 6, 2001 meeting. Based upon the current schedule, bids for construction of Well No. 5 capital improvements will be received on June 12, 2001. The attached Gantt chart illustrates the dates of the timeframe of the three project phases and the dates of major project milestones.

6. Monitoring and Assessment

The CSJC-Water Engineering Staff will monitor well water production by tabulating daily meter readings and will assess the effectiveness of treatment by reviewing periodic data from the CSJC water quality sampling laboratory analysis program. The CSJC-Water Production Staff is responsible for providing daily production records for all CSJC wells and imported supply sources. As a minimum, the CSJC-Water Production Staff also performs routine water system sampling and water quality in accordance with State Water Codes.

C. Outreach, Community Involvement, and Information Transfer

1. Outreach Efforts

Not applicable to this project.

2. Training, employment, and capacity building potential

It is anticipated that the plant will be operated and maintained by the current CSJC-Water Production Staff. Approximately three staff members are expected to receive training additional to supplement their current American Water Works Association (AWWA) Water Treatment Operator Certification.

3. Plan for Disseminating Information

An article will be written and published to disseminate information on the project results. The CSJC staff will consider publication of an article and/or presentation to one or more organizations such as the American Water Works Association (AWWA), the American Public Works Association (APWA), the California Urban Water Conservation Council (CUWCC) and the Association of California Water Users (ACWA).

4. Impacted or Cooperating Agencies

In the past, the South Coast Chapter of the National Audubon Society (Audubon Society) and the CSJC have worked together on a habitat enhancement program in the area surrounding the Well No. 5 site. The CSJC Water Conservation

Coordinator has attended the SCC-NAS meeting to inform SSC-NAS members about the project. The CSJC staff intends to solicit Audubon Society input to mitigate any environmental impacts that the facility may have on the surrounding area.

The CSJC also provides water service to approximately 1,000 customers located within the City of Dana Point. The CSJC Water Conservation Coordinator has sent a notification letter to the City of Dana Point to provide information about the project to these Dana Point customers. Copies of the Audubon Society letter to the CSJC and the CSJC letter to the City of Dana Point are attached to this application as Exhibit B.

D. Qualifications of the Applicants, Cooperators, and Establishment of Partnerships

1. Include a résumé(s) of the project manager(s).

The following individuals from the City of SJC and the engineering consultant:

- CSJC Project Manager: Eric P. Bauman, P.E., Senior Engineer
- CSJC Water Conservation Coordinator: Francie Kennedy
- Engineering Consultant: To be determined

Résumés for Mr. Bauman and Ms. Kennedy are attached as Exhibit C. The résumé of the engineering consultant project manager will be available following staff review of proposals and consultant selection.

2. Describe the role of any external cooperators.

3. Provide information about partnerships developed.

a. External cooperators/community partnership past and present

Well No. 5 is located adjacent to San Juan Creek, with a network of heavily used paths, bike trails, and equestrian trails crossing alongside the fence, and nearby. Audubon Society was tremendously active with a grass-roots effort to begin Arundo removal and enhancement of the Well No. 5 site along San Juan Creek beginning in 1994-95. This effort continued actively for 3 years, with regular planting and meeting days, continuing weeding and mulching. Estimated volunteer man-hours expended by Audubon, family, friends, scouts, church groups, and City staff total 4,000 to 5,000 hours. The results of these efforts continue to flourish. The knoll immediately adjacent to Calle Arroyo has been permanently transformed from a bare, eroding dirt-bike jump to an enduring mature growth of appropriate native plants. Several large and invasive patches Arundo have been eradicated, and additional native plantings surrounding the well site have grown, with specimen sized Coast Live Oaks, Ceanothus, and other natives.

b. External cooperators/community partnership future

At the regular Audubon Society meeting of February 8, 2001, Francie Kennedy, CSJC Water Conservation Coordinator gave an oral presentation to the group, describing the City's plans to rehabilitate the well. Rehabilitation of this well was described as a key to:

- access to the local source of supply;
- use of lower quality ground water as the least expensive and most reliable source for water civic and common-area landscapes; and
- avoided purchase of treated, potable water imported from the Colorado River and the Bay-Delta, via MWDOC, now supplementing the non-domestic supply.

Ms. Kennedy invited Audubon Society members to provide input on environmental mitigation and enhancement, as plans proceed to rehabilitate the well, and indicated that she would like to include an educational component to the grant, and extend links with Ambuehl Elementary School and Dana Hills High School (DHHS) (both in Capistrano Unified School District, CUSD) and their active outdoor education programs in the immediate vicinity. Together, the City and the schools along with Audubon Society members envision plant and bird walks, with a trail guide map to points of interest, led by Audubon and/or DHHS students to inform the community about its native resources including water. Audubon Society-South Coast Chapter President Paul Moreno wrote a note expressing the common interests between these civic groups, attached.

Enhancement and education cost estimate	**Cost**
Habitat restoration: plants and related materials	$5,200
Transportation of CUSD students	$7,000
Student research: texts and tools	$2,500
City Staff time coordinating project	$5,000
Trail map, other public info, signs	$4,000
TOTAL ESTIMATED COST	**$23,700**

A line item for the enhancement cost is included in the cost estimate that is presented in Section E of this application. A copy of an Audubon Society letter to the CSJC is attached to this application as Exhibit B.

E. Costs and Benefits

1. Budget Summary and Breakdown

The CSJC-Water Engineering Staff has prepared a budget breakdown and budget summary and economic analysis for the Well No. 5 Rehabilitation project. The budget breakdown and budget summary is divided into following three components:

- Section A CSJC staff and engineering consultant costs,
- Section B Project construction costs,
- Section C Operation and maintenance costs.

Table 1 presents the detailed budget breakdown and budget summary. The total of Sections A and B in Table 1 are the two components of the total capital cost for the Well No. 5 Rehabilitation project. As shown, the total estimated capital cost is $832,100.

Section C of Table 1 contains annual operation and maintenance costs including estimates for power, chemicals, sludge disposal, staff operation and routine maintenance costs. The total estimated annual cost for maintenance is $104,218.

2. Budget Justification

Each acre-foot of water produced at Well No. 5 will result in a savings of an acre-foot of imported domestic water purchased from MWDOC. Therefore, the City's current cost of imported domestic water or acre-foot of $430 per acre-foot is used as the benchmark to determine whether the project is economically viable. If the sum of the project's amortized capital costs and annual costs are less than the City's cost for imported water, than the project will provide a local water source at a lower cost and is economically justified. If the sum of the project's amortized capital costs and annual costs are greater than the City's cost for imported water, than the project will not provide a local water source at a lower cost and is not economically justified.

3. Benefit Summary and Breakdown

Implementation of this project will enable the City to realize a savings of at least 650 acre-feet per year of imported water supply purchased from MWDOC. Well No. 5 will be used as a water supply source to the City's non-domestic water system, which serves the irrigation demands of parks, agricultural demand, homeowners' association common areas and commercial/industrial/institutional (CII) landscaped areas.

The City non-domestic water system has an average annual demand of 789.2 gallons per minute (gpm). In addition, the non-domestic water system master

plan identifies an additional 1,010 gpm of existing demand that can be converted to non-domestic water. The existing demand is served from two existing wells, the Hollywood and Mission Street Wells, which have a combined production capacity of approximately 600 gpm. The deficit between non-domestic water supply and demand is currently met by adding domestic water to the non-domestic water system. Construction of Well No. 5 will provide an additional 800 gpm of local groundwater supply to the non-domestic water system. The additional supply provided by Well No. 5 will eliminate the current non-domestic water supply deficit and allow the City to convert additional irrigation services to non-domestic water use.

4. Assessment of Costs and Benefits.

An economic analysis has been prepared to assess the costs and benefits of the Well No. 5 project. Table 1 presents the details of the economic analysis. The following key assumptions have been made to prepare the analysis:

- The projected annual production from Well No. 5 is 50 percent of its design capacity. At 800-gpm design capacity, Well No. 5 would produce 1,290 acre-feet per year at 100 percent utilization. A 50 percent utilization rate or 645 acre-feet per year is assumed to allow for daily and seasonal demand variations. The CSJC-Water Engineering Staff believes that this assumption for utilization is a conservative estimate, considering the fact that demand is projected to continue to exceed non-domestic water supply as new users are connected to the system. Existing CSJC non-domestic water wells currently average approximately 60 percent utilization.

- Sections A and B of Table contain all estimated capital costs for the Well No. 5 project, including CSJC staff expenses, engineering consultant costs and construction costs. A 15 percent contingency is has been added to the total estimated capital cost.

- Capital costs are expressed in present value year 2000 dollars. Capital costs have been converted to annual cost amortized at 6 percent simple interest over 20 years.

- Section C contains all annual costs including the costs for power, chemicals, sludge disposal and routine maintenance.

Page 2 of Table 1 presents the economic analysis for Well No. 5. The total annual cost is $176,764, including the amortized capital costs and the annual operation and maintenance costs. The unit cost of water production from Well No. 5 is $274 per acre-foot based upon 50 percent design capacity utilization or 645 acre-feet per year. The City's current cost of imported water from MWDOC is $430 per acre-foot.

The City will realize a cost savings of $156 per acre-foot of water in year 2000 dollars by utilizing water produced at Well No. 5. The economic analysis for

Well No. 5 does not include any consideration for probable escalation of imported water costs in the future. It is concluded that the Well No. 5 project will:

- provide a lower cost source of non-domestic water,
- increase utilization of local groundwater resources,
- reduce the City's consumption imported water purchased from MWDOC, thereby reducing demand on Bay-Delta supplies imported to Southern California.

WELL NO. 5 REHABILITATION AND WELLHEAD TRETAMENT FOR IRON AND MANGANESE REMOVAL
BUDGET BREAKDOWN, BUDGET SUMMARY AND ECONOMIC ANALYSIS

A. CSJC Staff and Consultant-- Feasibility Study and Engineering Cost Estimate		
Line No.	**Item**	**Amount**
A1.	CSJC Staff Hours & Expenses Cost	$ 10,000
A2.	Engineering Consultant Budget	$ 100,000
A3.	Enhancement & Education Cost	$ 23,700
	Total CSJC Staff and Consultant Cost	**$ 133,700**
B. Construction Cost Estimate		
Line No.	**Item**	**Amount**
B1.	Mobiliztion/Demobilization	$ 20,000
B2.	Clear and Grub/Demolition	$ 15,000
B3.	Grading & misc.site work	$ 10,000
B4.	Construct concrete foundation	$ 20,000
B5.	Install new well pump	$ 25,000
B6.	Install new electric motor (100 hp)	$ 8,400
B7.	Wellhead Water Treatment System	$ 240,000
B8.	Addition for Sodium Hypochlorite Generation	$ 25,000
B9.	Piping, valves & appurtenances	$ 50,000
B10.	Install new electric & instrumentation panels	$ 50,000
B11.	Electical conduit and wires	$ 35,000
B12.	10,000 gallon clearwell tank	$ 25,000
B13.	Backwash supply pump	$ 25,000
B14.	Effluent pump	$ 30,000
B15.	Perimeter fence	$ 5,000
B16.	Connection to sewer	$ 10,000
	Total Estimated Construction Cost	**$ 593,400**
Subtotal Estimated Capital Cost		**$ 727,100**
15% Contingency		**$ 105,000**
Total Estimated Capital Cost		**$ 832,100**
C. Operation and Maintenance Cost Estimate		
Line No.	**Item**	**Amount**
C1.	Power	$ 37,130
C2.	Chemicals	$ 14,688
C3.	Sludge Disposal	$ 2,400
C4.	Labor & Materials	$ 50,000
	Total Operation and Maintenance Cost	**$ 104,218**

WELL NO. 5 REHABILITATION (continued)

D. Economic Analysis				
	Amortization of Capital Cost		**$**	**72,546**
	(6% interest rate for 20 years)			
	Total Operation and Maintenance Cost		**$**	**104,218**
	Total Annual Facility Cost		**$**	**176,764**
	Annual Water Production (af/yr)	**645.4**		
	Cost per Acre-foot of Water		**$**	**274**

Power cost-pump station ($/year)		$	37,130
Total Dynamic Head (ft)		$	300
Average Annual Flow (cfs)	0.83		
Cost of Power ($/kilowatt-hour)		$	0.150
Efficiency	0.75		
Hours per day of operation	12		
Hours per year of operation	4380		
Chemicals-Cost per day		$	80.48